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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/804,758

03/19/2004

Walter Feller

4007

7686

7590

01/26/2007

Mark Brown
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Suite 130
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EXAMINER

ZANELLI, MICHAEL J

ART UNIT

PAPER NUMBER

3661

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/26/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/804,758

Applicant(s)

FELLER ET AL.

Examiner

Michael J. Zanelli

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/19/04; 12/29/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The application filed 3/19/04 has been examined. Claims 1-12 are pending.
2. The IDS filed 3/19/04 and 12/29/05 have been considered. Note that the PCT search report and written opinion satisfy the relevancy requirement but are not considered citable prior art in and of themselves.
3. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-11, drawn to a sensor system/method including global satellite sensor systems, classified in class 701, subclass 213.
 - II. Claim 12, drawn to method of controlling a vehicle including steering control, classified in class 701, subclass 41.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination II has separate utility such as controlling the steering of a vehicle based on generic position and heading information. The specific details of the sensor system/method as set forth in claims 1-11 are not required for establishing the patentability of method claim 12. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP

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§ 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification and the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Mark Brown (30361) on January 17, 2007 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-11. Affirmation of this election must be made by applicant in replying to this Office action. Claim 12 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

5. Claims 9-11 are objected to because of the following informalities:

- A. As per claim 9, "configure" should be --configured--.
- B. As per claim 10, at line 2 delete "a" since a plurality of systems are recited.

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- C. All claims depending from an objected base claim are also objected to as containing the same deficiencies.
6. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
- A. As per claim 1, "said lateral motion" and "said vehicles" lacks antecedence. Also the claim appears to be inconsistent in that lines 2-5 make the determination of the heading as optional whereas lines 9-11 appear to require the heading in order to generate the steering command.
- B. As per claim 4, "said GPS based heading angle" lacks antecedence. Note that applicant's definition of "GNSS" is not limited to exclusively GPS (see spec. [0020]).
- C. As per claim 5, "said GPS based roll angle" lacks antecedence. Note that applicant's definition of "GNSS" is not limited to exclusively GPS (see spec. [0020]).
- D. All claims depending from a rejected base claim are also rejected as containing the same deficiencies.
7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:
- A person shall be entitled to a patent unless –
- (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
8. Claims 10-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Hrovat et al. (6,671,587).

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A. As per claims 10 and 11, Hrovat discloses a method for computing a position of a vehicle which includes two or more global navigation satellite sensor systems in which the position of at least a first antenna and a second antenna are computed and at least a heading vector is determined based on the computed position information and the known distances between the antennas on a vehicle body. From the satellite information and the orientation of the antennas on the vehicle one may compute various position and vehicle dynamic parameters such as roll angle, pitch angle, yaw angle, longitudinal/lateral velocities, etc. (Figs. 1-10; cols. 3, lines 41-61; col. 4, lines 53-58; col. 5, line 66 to col. 6, line 7; col. 7, lines 1-13).

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1 and 4-9, as best interpreted given the deficiencies noted above, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hrovat et al.

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A. As per claim 1, Hrovat discloses a sensor system which may be used in controlling various vehicle control systems. The sensor system (i.e., Fig. 5) comprises a plurality of global satellite sensor systems including receivers (18a,b) and antennas (12a,b) at fixed spacing on a vehicle (see Figs. 1-3) whereby various vehicle position and dynamic operating parameters (heading, roll, pitch, longitudinal/lateral velocity, etc.) may be determined based on carrier phased corrected real-time position differences (col. 3, lines 25-62; col. 4, lines 14-35). Position and roll parameters are determined in part based on the orientation of the antennas on the vehicle (col. 7, lines 1-12). A control system may be configured to receive the position and dynamic operating parameters to control various onboard control systems (Fig. 5:26). The claimed invention differs in that the parameters are provided to a system for controlling steering. However, one of ordinary skill in the art would have found it obvious to apply the teachings of Hrovat to control systems other than those examples explicitly disclosed (i.e., suspension and braking: col. 4, lines 53-62). Since steering affects the dynamic operation of the vehicle, one of ordinary skill in that art would have been motivated to apply the position and dynamic parameters generated by Hrovat to a vehicle steering system to improve overall vehicle control.

B. As per claims 4 and 5, as above whereby Hrovat suggests incorporating rate gyros (col. 7, line 61 to col. 8, line 4).

C. As per claims 6, 7 and 9, as above whereby the physical configuration of the antenna/receiver structures on the vehicle would have taken into consideration the type of

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vehicle, environmental concerns, costs, manufacturing, etc., consistent with the operation of the system.

D. As per claim 8, as above whereby Hrovat discloses using various known global navigation sensor systems (col. 4, lines 33-35).

11. Claims 1-3, 8, 10 and 11, as best interpreted given the deficiencies noted above, are rejected under 35 U.S.C. 103(a) as being unpatentable over Parkinson et al. (6,052,647).

A. As per claims 1, 10 and 11, Parkinson discloses a sensor system for vehicle steering comprising a plurality of global navigation satellite sensor systems including receivers and antennas at fixed spacing on a vehicle (col. 5, line 64 to col. 6, line 2) to determine vehicle position and at least heading based on carrier phase corrected real time kinematic position differences (col. 6, lines 6-14) whereby corrections may be for position errors caused by the pitch and roll of the vehicle as it travels over terrain (col. 9, lines 6-15). A steering control system receives position, heading, and other determined parameters to control the steering of the vehicle (col. 6, lines 6-18). Although Parkinson discloses taking into account vehicle velocity at col. 6, lines 33-37, the document does not explicitly state that the velocity is obtained by the global navigation satellite sensor system. However, one of ordinary skill in the art would have recognized that the velocity information could be provided using the well-known relationship between speed/distance/time. Parkinson suggests that the vehicle velocity is determined relative to position and time measurements insofar as parameters are dynamically calculated over successive measurement intervals (col. 6, lines 30-37).

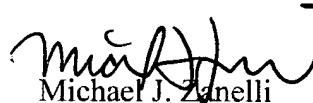
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- B. As per claims 2 and 3, as above whereby the steering of the vehicle may be controlled such that its heading follows a desired trajectory (col. 6, lines 6-14; col. 8, lines 44-49).
- C. As per claim 8, as above whereby the global navigation satellite sensor system includes at least GPS (col. 1, lines 6-11).
12. Claims 4-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parkinson et al. in view of Pinto et al. (2002/0165669).
- A. As per claims 4 and 5, Parkinson is applied as above. The claimed invention differs in that yaw and roll rate gyros are provided. However, at the time of applicant's invention it was known to combine GPS and inertial systems to improve the accuracy of navigation calculations (see as exemplary Pinto:[0127]). One of ordinary skill in the art would have found it obvious to improve the accuracy of the calculations of Parkinson by using inertial sensor inputs as was known in the art.
- B. As per claims 6, 7 and 9, as above whereby the physical configuration of the antenna/receiver structures on the vehicle would have taken into consideration the type of vehicle, environmental concerns, costs, manufacturing, etc., consistent with the operation of the system.
13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited documents are of general interest.
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Zanelli whose telephone number is (571) 272-6969. The examiner can normally be reached on Monday-Thursday 9:00 AM - 4:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Michael J. Zanelli
Primary Examiner
Art Unit 3661

/mjz